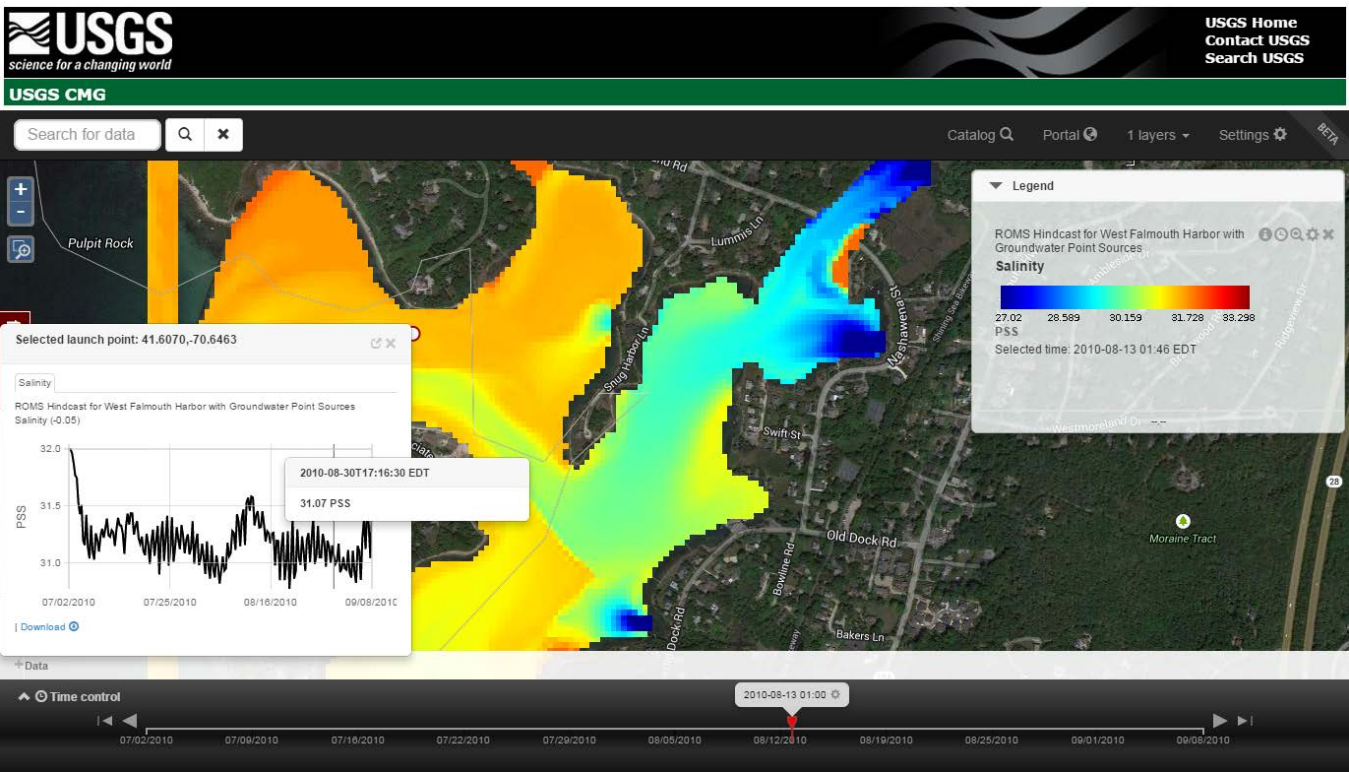
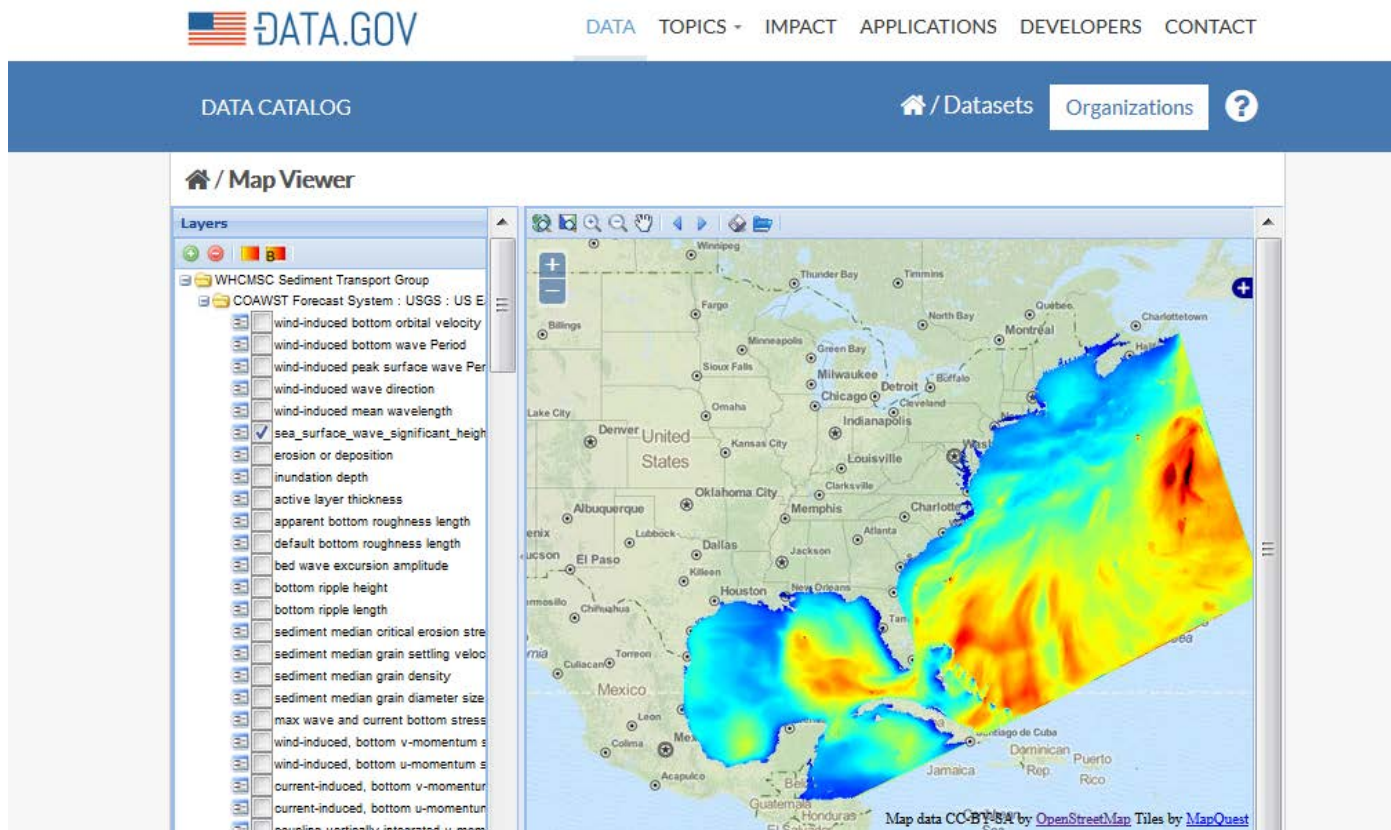
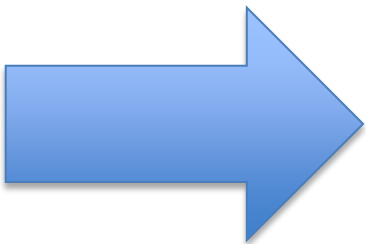
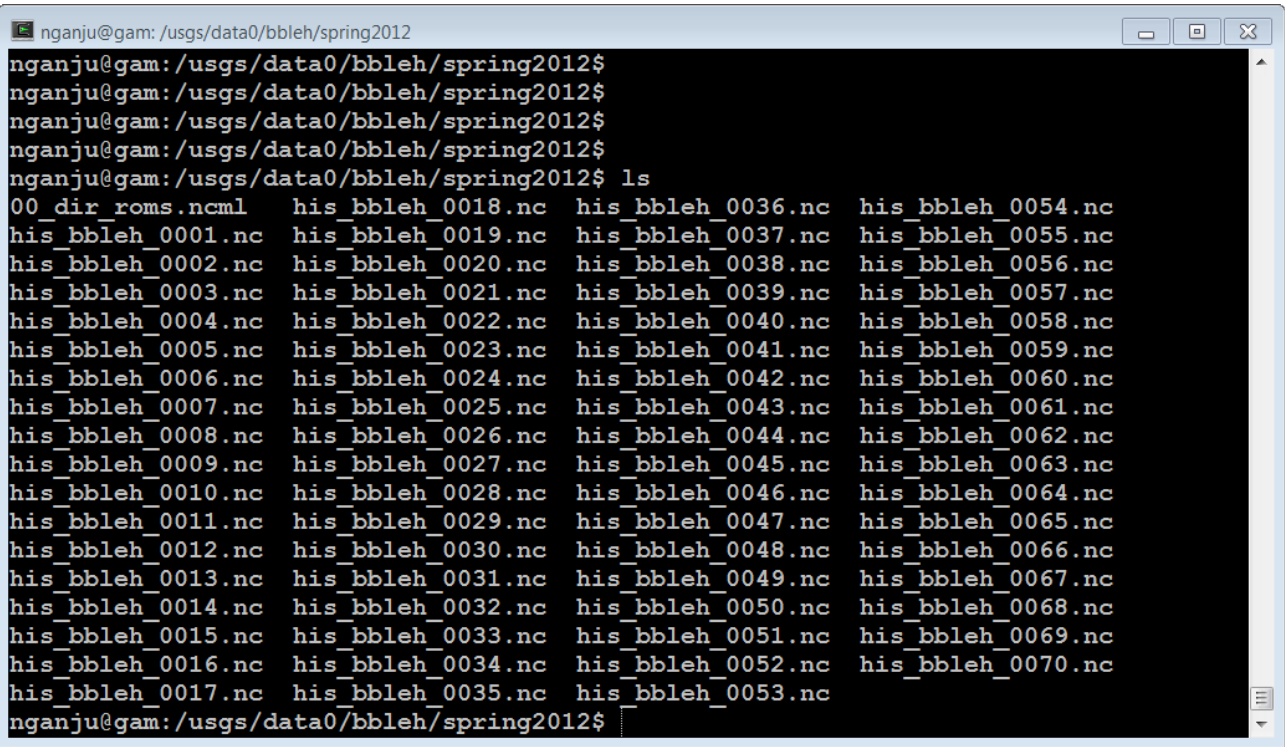


A Distributed, Standards-Based Framework and Open-Source Software Stack for Searching, Accessing, Analyzing and Visualizing Met-Ocean Data: Application to Hurricane Sandy

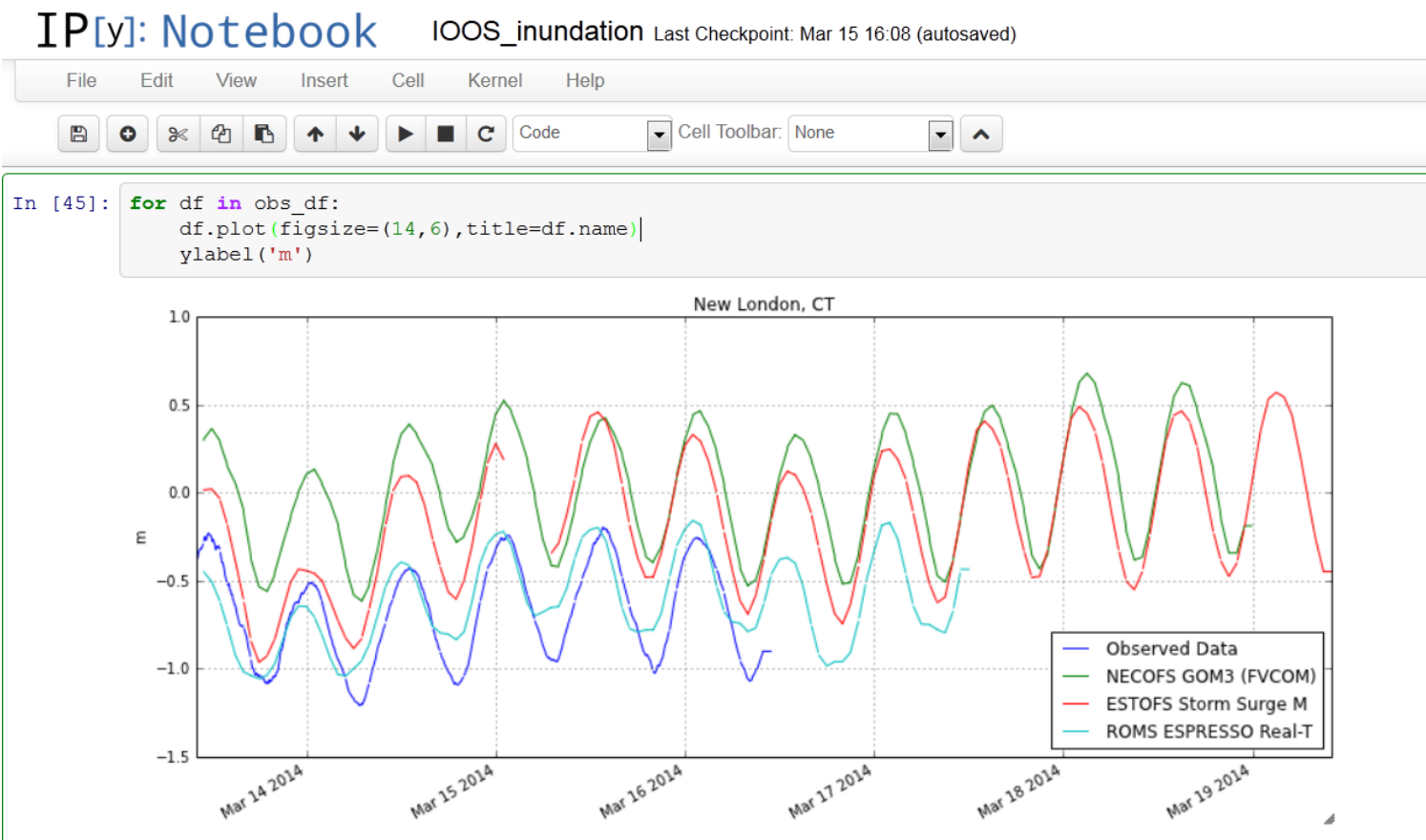
Authors: Rich Signell, USGS/CMGP, rsignell@usgs.gov Andrew Yan, USGS/CIDA, ayan@usgs.gov Filipe Fernandes, SECOORA, ocefpaf@gmail.com Kyle Wilcox, Axiom Data Science, kyle@axiomdatascience.com

How do we get from a piles of files like this...

To catalog-driven portals and applications like this...



COAWST results from West Falmouth Harbor



Provider:

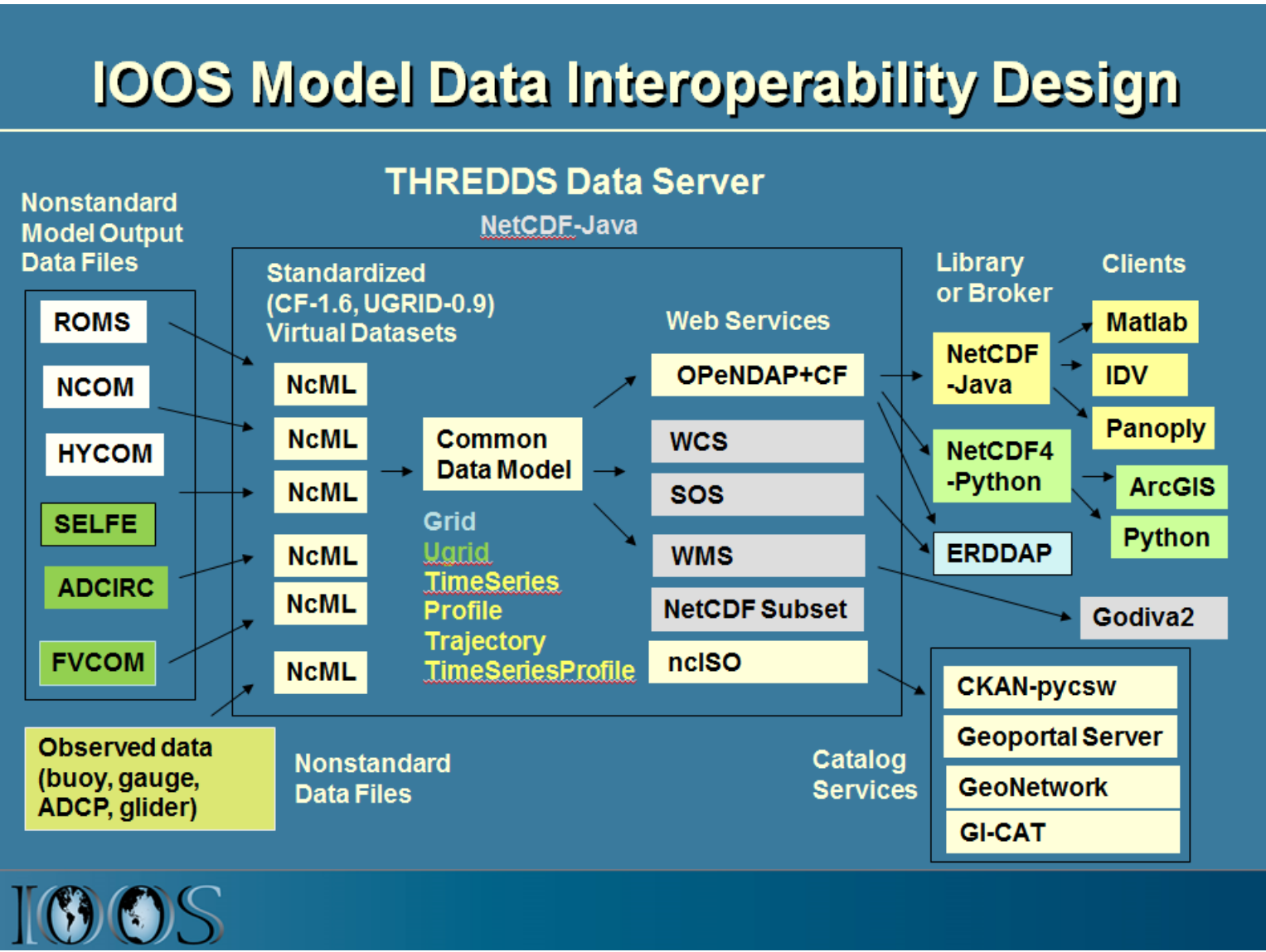
- Writes file of netcdf files to a directory
- Generates a yaml file describing the data and indicating whether data should be picked up by a specific portal
- Run python script to generate NcML file that aggregates and makes dataset CF compliant and UGRID/SGRID compliant if appropriate

Application/User:

- CSW query to discover datasets matching keywords and geospatial/temporal extents
- Extract WMS and OPeNDAP service endpoints from the dataset metadata records
- Create browse graphics via WMS map requests
- Extract data via OPeNDAP data requests
- Utilize CF/UGRID/SGRID conventions for ineroperability

Automated process:

- Specified thredds servers are crawled on a schedule by a python script, which extracts ISO metadata
- creates a WMS service by registering the dataset with sci-wms
- Injecting the WMS endpoint into the ISO metadata
- Datasets with matching “project” tags are picked up by the portal



Abstract: There have been significant recent advances in common data models, web services, and python-based tools for search, access, analysis and visualization. It is now possible to supply an individual or organization with a complete, free, open-source framework that enables: (1) providers to easily serve their data in standardized form without impacting their existing workflows (using Unidata THREDDS Data Server, sci-wms and pycsw); (2) users to perform standardized search for data (using pyoos and OWSLib); (3) users to analyze and visualize data (using Iris, Cartopy, Pandas, Folium, mplleaflet, Jupyter notebooks and Wakari Enterprise). This framework relies on the CF-Standard for describing data in grids, profiles, time series, on the UGRID standard for describing data on unstructured (e.g. triangular) grids, and on the newly developed SGRID standard for describing data on staggered grids (commonly used in atmospheric and oceanographic models). These standards enable unified access via WMS image service endpoints and OPeNDAP/SOS data service endpoints. The entire infrastructure will be demonstrated using Hurricane Sandy datasets from multiple institutions.